IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

NATIONAL CHENG KUNG UNIVERSITY	§	
	§	
v.	§	Case No. 2:13-CV-452-JRG-RSP
	§	
SAMSUNG ELECTRONICS CO., LTD., et al.	§	
	§	

CLAIM CONSTRUCTION
MEMORANDUM AND ORDER

Before the Court is Plaintiff National Cheng Kung University ("Plaintiff")'s Opening Claim Construction Brief (Dkt. No. 48, filed April 10, 2014), the response of Defendants Samsung Electronics Co., Ltd., *et al.* (Dkt. No. 50, May 1, 2014) ("Defendants" or "Samsung"), and the reply of Plaintiff (Dkt. No. 52, May 15, 2014). The Court held a claim construction hearing on June 11, 2014. Having considered the arguments and evidence presented by the parties at the hearing and in their claim construction briefing, the Court issues this Claim Construction Order.

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I. BACKGROUND

Plaintiff alleges infringement of United States Patent No. 7,418,131 ("the '131 patent" or "patent-in-suit") in this lawsuit. Plaintiff accuses the Defendants of infringing claims 6 and 9 of the '131 patent. (*See, e.g.*, Dkt. No. 48 at 4.)

The application leading to the '131 patent was filed on July 6, 2005, which was based on a foreign application filed on August 27, 2004. The '131 patent issued on August 26, 2008, and is entitled "Image-Capturing Device and Method for Removing Strangers from an Image." In general, the '131 patent is directed to an image-capturing device and method for removing strangers or unwanted objects from an image using various processing algorithms. The Abstract of the '131 patent states:

> An image-capturing device and method for removing strangers from an image are described. First, a first image is input. Then, a control module determines if an unwanted object processing step is needed, and obtains a result. If the result is no, the first image is directly sent to an output module. If the result is yes, an image-identifying module begins to identify the target-image and the unwanted object in the first image, and then, an unwanted object processing module starts the step to process unwanted images. The unwanted object processing step can remove the unwanted object from an image and fill the left lacuna region. Afterwards, a second image is produced and sent to the output module.

Asserted claim 6 of the '131 patent is shown below with the Parties' agreed edits[1]:

> An image-capturing method, suitable in an image-capturing device for removing an unwanted object from an image, the image-capturing method comprising:
>
> inputting a first image;
>
> determining if an unwanted object processing step should be performed on the first image, and obtaining a result;
>
> if the result is no, directly sending the first image to an output module;
>
> if the result is yes, starting an identifying step to identify at least a target-image and at least an unwanted object in the first image, and performing an unwanted

[1] (*See, e.g.*, Dkt. No. 54-1 at 4.)

object processing step to generate a second image, wherein the unwanted object processing step comprises:

removing the unwanted object and leaving at least a lacuna region in the first image,

wherein another part of the first image other than the lacuna region is a background area, and the background area has a plurality of first pixels around a boundary of the lacuna region;

performing a color distribution analysis step on first pixel to adjust the texture characteristics around the lacuna region; and

performing a copy step to copy part of the first pixels and insert copied first pixels into the lacuna region to form a filled-in area, wherein the step of copying part of the first pixels and inserting the copied first pixels into the lacuna region is in accordance with an algorithm, and the algorithm comprises;

dividing the lacuna region into a plurality of sub-areas, wherein the sub-areas are bar-shaped and each of the sub-areas has a plurality of second pixels;

according to the sub-areas, dividing the background area into a plurality of image source areas, wherein each sub-area and each corresponding image source area are in the same row or the same column, and each image source area has a plurality of third pixels;

weighting and computing the values of the third pixels and inserting a result into the second pixels, wherein the step of weighting and computing the values of the third pixels and inserting the result into the second pixels is in accordance with an equation:

$$P_{Mi''} = \left(\sum_{n=i''-2}^{i''+2} W_n P_{Ln} + \sum_{n=i''-2}^{i''+2} W_n P_{Rn} \right) /2,$$

where i' denotes the column or the row in the image, W is a weighted value, Wi'+2 and Wi'+2=0.05, and Wi'=0.4 if PLn and PRn are in the background area and PMi' is a pixel value in the lacuna region, and if PLn or PRn are in the lacuna region, Pi'+1=2Pi'−1, Pi'+2=2, Pi'−Pi'−2, Pi'−1=2Pi'−Pi'+1, and Pi'−2=2Pi'−Pi'+2 are further included;

sending the second image to the output module; and

the output module outputting the first image or the second image.

II. LEGAL PRINCIPLES

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To determine the meaning of the claims, courts start by considering the intrinsic evidence. *See id.* at 1313; *see also C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1314; *C.R. Bard*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312-13; *accord Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314. First, a term's context in the asserted claim can be very instructive. *Id.* Other asserted or unasserted claims can aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314-15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id.* at 1315 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[T]he specification 'is always highly relevant to the claim construction analysis.

Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *accord Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id.* The specification may also resolve the meaning of ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex*, 299 F.3d at 1325. But, "[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims." *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *accord Phillips*, 415 F.3d at 1323.

The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc., v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent."). "[T]he prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985).

Although extrinsic evidence can be useful, it is "less significant than the intrinsic record in determining the legally operative meaning of claim language." *Phillips*, 415 F.3d at 1317

(citations and internal quotation marks omitted). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition are entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.*

III. STIPULATED CONSTRUCTIONS OF AGREED TERMS

The Parties have stipulated to the following agreed constructions:

Term	**Agreed Construction**
"target-image" (claims 6, 9)	**"wanted object (within the first image that is not to be removed by the unwanted object processing step)"**
"first image" (claims 6, 9)	**"single image that is captured before all other images by the image capturing device"**
"a second image" (claim 6)	**"an output image generated by the image capturing device that resulted from processing the first image by performing the unwanted object processing step"**
"**plurality of**" (claim 6)	**"two or more"**
"first pixels around a boundary of the lacuna region" (claim 6)	**"pixels that form the immediate border outside of the lacuna region"**
"performing a color distribution analysis step on first pixel to adjust the texture characteristics around the lacuna region" (claim 6)	**"analyzing the RGB values of the first pixels to determine whether the first pixels are inhomogeneous or homogeneous in color characteristics"**

"performing a copy step to copy part of the first pixels and insert copied first pixels into the lacuna region to form to form [*sic*] a filled-in area, wherein the step of copying part of the first pixels and inserting th [*sic*] copied first pixels into the lacuna region is in accordance with an algorithm, and the algorithm comprises:" (claim 6)	**(Error and duplicate; should be deleted)**
"wherein and computing" (claim 6)	**"weighting and computing"**

(Dkt. No. 54-1, 05/22/2014 Joint Claim Construction Chart.)

IV. CONSTRUCTION OF DISPUTED TERMS

The parties' positions and the Court's analysis as to the disputed terms are presented below.

A. "performing a copy step to copy part of the first pixels and insert copied first pixels into the lacuna region to form a filled-in area, wherein the step of copying part of the first pixels and inserting the copied first pixels into the lacuna region is in accordance with an algorithm, and the algorithm comprises…:"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"copying a portion of at least one of the first pixels and insert the copied portion of at least one of the first pixels into the lacuna region to form a substitute area"	"if the first pixels are determined to be homogeneous in texture, performing a step in which the values of part of the first pixels in the first image are used in accordance with a weighted interpolation algorithm, and the resulting pixel values are inserted into the lacuna region, wherein the weighted interpolation algorithm comprises:"

The disputed term "performing a copy step …" appears in asserted claim 6 of the '131 patent.

(1) The Parties' Positions

Plaintiff submits that the "performing a copy step…" term does not require construction and should be afforded its plain and ordinary meaning. (*See, e.g.*, Dkt. No. 48 at 4, 9-12.)

Plaintiff argues that the term should be provided its plain and ordinary meaning and that such a construction is consistent with the term's ordinary meaning and how one of ordinary skill in the art would understand the term. (*Id.*) Plaintiff argues that Defendants' construction contradicts the plain meaning and includes imported limitations from the specification. (*Id.*) In particular, Plaintiff argues that Defendants' construction impermissibly limits the term to a preferred embodiment. (*Id.* at 10-11.) Plaintiff argues that the specification states that several algorithms used in the performing a copy step can be used independently of one another, and that while the "performing a copy step…" limitation can be used with a weighted interpolation algorithm, it is not necessarily limited to such an algorithm. (*Id.* at 12.) Plaintiff argues that Defendants' construction would exclude other preferred embodiments from this claim. (*Id.* at 12-13.)

Defendants respond that the term "performing a copy step…" is necessarily limited to a weighted interpolation algorithm because the weighted interpolation algorithm limitations are already expressly included in claim 6. (Dkt. No. 50 at 2.) Defendants argue that during prosecution the Applicant added these limitations to the claims to secure allowance. (*Id.* at 2, 9-15.) In particular, Defendants' argue that the examiner rejected most of the original claims but allowed certain dependent claims that included the weighted interpolation algorithm limitations, including the claim that became issued claim 6. (*Id.*) Thus, Defendants argue that they are not importing any limitations. (*Id.*) Further, the Defendants argue that the limitation should be limited to homogenous textures for two reasons: 1) because a weighted interpolation algorithm is only used for such textures; and 2) the previously recited and agreed to term for "performing a color distribution analysis step…" would be rendered meaningless otherwise. (*Id.* at 15-17.)

In other words, Defendants argue that there is no reason to have the "performing a color distribution analysis step…" unless the result would have an impact on the subsequent

"performing a copy step…" Under Defendants' interpretation, the claimed algorithm is used only if the color distribution analysis determines that the first pixels are homogenous. (*Id.* at 16.) Defendants argue that their construction and rationale is confirmed by the specification and the use of the words "present invention." (*See id.*at 16-17*; see also* '131 patent at col. 6, ll. 25-31.) Defendants argue that Plaintiff's construction ignores the fact that the limitation expressly includes a weighted interpolation algorithm and ignores the prosecution history. (*Id.* at 17-18.) Thus, Defendants argue that the fact that the claim is limited to one of the disclosed embodiments is warranted. (*Id.*)

Plaintiff replies that Defendants' construction is improperly limiting the claim to a single preferred embodiment and excludes other embodiments of the specification. (Dkt. No. 52 at 2-6.) In particular, Plaintiff argues that the claim is not limited to a weighted interpolation algorithm. (*Id.*) Plaintiff argues that the prosecution history states that the algorithm can be a sub-patch texture synthesis algorithm and is therefore not limited to a single weighted interpolation algorithm. (*Id.*) Plaintiff argues that claim 6 only recited a general algorithm and not a specific weighted interpolation algorithm. (*Id.* at 3-4.) Further, Plaintiff argues that Defendants' construction impermissibly limits the weighted interpolation method to be used only for homogenous textures. (*Id.* at 5.) However, Plaintiff argues that the claimed method can also be used in other embodiments, such as inhomogenous textures. (*Id.*)

(2) Analysis

The parties' primary disputes as to this term are whether it is limited to a (i) weighted interpolation algorithm or allows for different algorithms and (ii) whether the term is limited to only homogenous textures. The claims, prosecution history, and specification are relevant to the parties' disputes as to this term.

Claim 6 provides that, if an unwanted object processing step should be performed on an inputted first image, the steps of starting an identifying step to identify at least a target-image and at least an unwanted object in the first image and performing an unwanted object processing step to generate a second image should be performed. Claim 6 further provides that the unwanted object processing step comprises three parts:

i. removing the unwanted object and leaving at least a lacuna region in the first image;

ii. performing a color distribution analysis step on first pixel to adjust the texture characteristics around the lacuna region; and

iii. performing a copy step to copy part of the first pixels and insert copied first pixels into the lacuna region to form a filled-in area.

Claim 6 further provides that the performing a copy step is in accordance with an algorithm that comprises three parts:

i. dividing the lacuna region into a plurality of sub-areas;

ii. according to the sub-areas, dividing the background area into a plurality of image source areas; and

iii. weighting and computing the values of the third pixels and inserting a result into the second pixels according to a particular equation (which is specified in the claim).

The prosecution history is particularly relevant to this limitation. During prosecution, the examiner rejected all of the pending claims over the cited prior art but for claims 16, 18, and 19, to which the examiner objected but deemed allowable if rewritten in independent form (including all of the limitations of the base claim and any intervening claims). (*See, e.g.*,

November 19, 2007 Office Action, attached as Exh. D to Defendants' Responsive Brief, SAMS152 at 923-944; *see also* Dkt. No. 50 at 9-11.) In response, the Applicant cancelled claims 1-6 and created two independent claims, one that included all of the limitations of claim 16 (amended into then-pending claim 7) and one that included all of the limitations of claim 18 (created in new claim 20). (*See, e.g.*, Response to November 19, 2007 Office Action, attached as Exh. D to Defendants' Responsive Brief, SAMS152 at 967-976; *see also* Dkt. No. 50 at 9-11.) Thus, then-pending claim 20 (which is now asserted claim 6) corresponds to original claim 18 and all of its intervening claims and base claim, in particular original claims 7, 11, 13, 17, and 18. (*See id.*; *see also* Exh. D to Defendants' Responsive Brief, SAMS152 at 861-866 (original claims).)

Regarding the parties' first dispute, the claim does not use expressly use the words "weighted interpolation algorithm." However, original claims 17 and 18 expressly stated that the recited algorithm is a "weighted interpolation method," and the limitations of claims 17 and 18 were added during prosecution to the original claim 7 to make it allowable over the cited prior art. (*See, e.g.*, Dkt. No. 50 at 9-11; *see also* Exh. D to Defendants' Responsive Brief, SAMS152 at 861-866, 967-976.) Likewise, the specification is clear that both the recited algorithm steps found in claim 6 and the equation found in claim 6 are in relation to the disclosed "weighted interpolation method." (*See, e.g.*, '131 patent at col. 9, l. 43 – col. 10, l. 16.) In contrast, the specification discloses a sub-patch texture synthesis algorithm (*see, e.g.*, col. 7, l. 50 – col. 9, l. 42), and the limitations of original claim 16 were directed expressly to this separate algorithm, which is now found in independent claim 1 (which is not asserted). While Defendants argue that the specification states the disclosed algorithms can be used independently of one another (*see, e.g.*, '131 patent, col. 6, l. 65 – col. 7, l. 3), that disclosure has no relevance to this disputed term.

Thus, based on the express language found in the claims, as well as the prosecution history and specification, claim 6 is directed to a weighted interpolation algorithm. Further, the Court notes that during the claim construction hearing, the Plaintiff conceded that the claim was directed to a "weighted interpolation algorithm."

Regarding the parties' second dispute, the Court is not convinced that Defendants' inclusion of the phrase "if the first pixels are determined to be homogeneous in texture" is necessary or warranted. There is no express language in the claim that conditions or bases the "performing a copy step…" on the result of the "performing a color distribution analysis step." In contrast, conditional language is used in another portion of claim 6 regarding whether the unwanted object processing step should be performed based on a determination step. (*See, e.g.*, claim 6 at col. 13, l. 66 – col. 14, l. 4.) That conditional language is noticeably absent regarding the disputed limitations. Further, the Court rejects Defendants' arguments that the sole purpose of the "performing a copy step…" is only to determine whether the image is homogenous or inhomogenous. First, this alleged purpose is not recited in the claims. Second, the specification is clear that the performing a color distribution analysis step can be used to adjust the texture characteristics in the image and further to decide either of the two disclosed methods in synthesizing. (*See, e.g.*, '131 patent, col. 10, ll. 53-56, col. 11, ll. 22-25.) The claim language of the "performing a color distribution analysis step…" expressly recites this adjusting the texture characteristics feature. While a preferred embodiment provides a measure of support for Defendants' arguments, there is nothing in the specification that requires such a limiting construction. Rejecting Defendants' construction does not render the prior limitation meaningless: the "performing a color distribution analysis step…" is a required limitation of the

claims regardless of whether the results of that step are used to determine whether the "performing a copy step…" must be performed.

The Court is not convinced that it should insert Defendants' conditional language into the claims. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (citing numerous cases rejecting the contention that the claims of the patent must be construed as being limited to the single embodiment disclosed and stating that claims are to be given their broadest meaning unless there is a clear disclaimer or disavowal); *see also Comark Commc'ns, Inc. v. Harris Corp.,* 156 F.3d 1182, 1187 (Fed. Cir. 1988) ("Although the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims."); *see also Phillips*, 415 F.3d at 1323. The Federal Circuit has consistently held that "particular embodiments appearing in the written description will not be used to limit claim language that has broader effect." *Innova/Pure Water,* 381 F.3d at 1117. Even where a patent describes only a single embodiment, absent a "clear intention to limit the claim scope," it is improper to limit the scope of otherwise broad claim language by resorting to a patent's specification. *Id*. Further, there is nothing in the claims or prosecution history that would require a specific result from the performing a color distribution analysis step before the performing a copy step is performed, and the express language of the claims makes no mention of performing a particular algorithm based on the particular result of the performing a color distribution analysis step. The Court rejects Defendants' arguments to the contrary.

The parties also dispute whether other terms and phrases within the disputed term should be used or construed. For example, Defendants argue that "copying" does not mean copying in the ordinary sense of the word (e.g., "to reproduce"), and Plaintiff uses the term "substitute" area

for the term "filled-in" area. The Court is not convinced that changing various easily understood terms in the disputed phrase is helpful or warranted. Because construing these terms will only tend to confuse rather than clarify, many of the constituent terms of the disputed phrase require no further construction. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims.") (*citing U.S. Surgical*, 103 F.3d at 1568). Further, the claim expressly states that the "performing a copy step … is in accordance with an algorithm, and the algorithm comprises: ...". The Court finds that this step expressly requires the recited algorithm, and there is no reason to disregard this requirement (as Plaintiff appears to do) in the construction. Likewise, the meaning of this disputed phrase is sufficiently described in the recited algorithm steps, and the Court rejects the Defendants' concerns as to the meaning of the "copying" terms as the disputed phrase's meaning is sufficiently described in the recited algorithm steps.

The Court hereby construes "**performing a copy step to copy part of the first pixels and insert copied first pixels into the lacuna region to form a filled-in area, wherein the step of copying part of the first pixels and inserting the copied first pixels into the lacuna region is in accordance with an algorithm, and the algorithm comprises**" to mean "**performing a copy step to copy part of the first pixels and insert copied first pixels into the lacuna region to form a filled-in area, wherein this step is in accordance with a weighted interpolation algorithm that comprises:**".

B. "second pixels" and "third pixels"

Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"second pixels"	Plain and ordinary meaning. In the alternative, "next to the first pixels"	"pixels located in the lacuna region that are to be filled in with values resulting from the weighted interpolation algorithm"
"third pixels"	Plain and ordinary meaning. In the alternative, "next to the second pixels"	"pixels that are a subset of the first pixels in the image source area and used in the weighted interpolation algorithm to obtain values to insert into the second pixels"

The disputed terms "first pixels" and "second pixels" appear in asserted claim 6 of the '131 patent.

(1) The Parties' Positions

Plaintiff submits that the "second pixels" and "third pixels" terms do not require construction and should be afforded their plain and ordinary meaning. (*See, e.g.*, Dkt. No. 48 at 4, 13-15.) In particular, Plaintiff argues that the specification's reference to a boundary region around the lacuna region supports its construction and implicitly equates the claimed "second pixels" to a first round of pixels surrounding a boundary and the claimed "third pixels" to a second round surrounding the first round of pixels. (*Id.* at 15-16.) Plaintiff argues that the Defendants' constructions impermissibly limit the terms with limitations imported from the specification and are inconsistent with the terms' plain meanings. (*Id.* at 17.)

Defendants respond that these terms cannot be easily understood by one of ordinary skill in the art without context and that, without construction, it is impossible to tell which pixels in an image are the second pixels or third pixels. (Dkt. No. 50 at 2.) Defendants argue that Plaintiff's constructions only confuse and are derived from a description of a step that is not relevant to the

asserted claims. (*Id.*) Defendants argue that the claim language and specification show that the pixels in the lacuna region are the second pixels and the pixels around the lacuna region are the third pixels. (*Id.* at 20.) Further, the Defendants argue that the third pixels are a subset of the first pixels, because the claim states that both "part of the first pixels" and the "third pixels" are used in the weighted interpolation equation. (*Id.* at 21-22.) Defendants argue that their construction is internally consistent with the entirety of the claim. (*Id.* at 22.) Defendants argue that their construction is not improperly limited to one embodiment, since Defendants' construction is based on the claim language and the narrowing of the claim during prosecution. (*Id.* at 22-23.) Further, Defendants argue that Plaintiff's constructions are inaccurate as they relate to portions of the specification that are not related to any of the steps referenced in asserted claims 6 and 9. (*Id.* at 23.) In particular, the "morphological dilation step" referenced in the specification and relied upon by Plaintiff is only mentioned in claim 11, and is thus not relevant to claim 6 and these disputed terms. (*Id.* at 23-24.)

Plaintiff replies that Defendants' constructions are contrary to the plain meaning of the terms. (Dkt. No. 52 at 6-7.) Plaintiff argues that the specification's reference to pixels of the first round surrounding the boundary and pixels of the second round surrounding the pixels of the first round support its constructions. (*Id.*) In other words, consistent with the terms' plain meanings, second and third pixels are merely rounds of pixels that surround the first round and second round of pixels, respectively. (*Id.*) Plaintiff disagrees with Defendants' arguments that the relied upon specification is relevant only to morphological dilation processing (recited in dependent claim 11) and not the claimed second and third pixels found in claim 6. (*Id.*)

(2) Analysis

The specification does not use the terms "second pixels" and "third pixels." The relevant claim language from claim 6 to "second pixels" and "third pixels" is shown below:

> dividing the lacuna region into a plurality of sub-areas, wherein the sub-areas are bar-shaped and each of the sub-areas has a plurality of **second pixels**;
>
> according to the sub-areas, dividing the background area into a plurality of image source areas, wherein each sub-area and each corresponding image source area are in the same row or the same column, and each image source area has a plurality of **third pixels**;
>
> weighting and computing the values of the **third pixels** and inserting a result into the **second pixels**, wherein the step of weighting and computing the values of the **third pixels** and inserting the result into the **second pixels** is in accordance with an equation:

(emphasis added.) The plain language of claim 6 requires the "second pixels" to be from sub-areas of the lacuna region, and the "third pixels" to be from image source areas of the background area. (*See id.*) Further, the plain language of the claim requires weighting and computing values of the third pixels according to the recited algorithm equation and inserting those values into the second pixels. (*See id.*) This is consistent with the specification's teaching:

> Reference is made to FIG. 7, which is a diagram of the weighted interpolation method in the preferred embodiment of the present invention. The pixel of source region 701 is used in the present invention to fill a lacuna region 702. For example, in filling the pixels 703 in the lacuna region 702, the pixels in the left source region 704 and the pixels in the right source region 705 in the same row with the pixel 703 are used. First, the pixel value in the left source region 704 multiplied by a weighted value and the pixel value in the right source region 705 multiplied by a weighted value are calculated, respectively. Then, the two results are averaged. The weighted value may be a Gaussian kernel. The result after averaging is the value of the pixel 703 in the lacuna region 702.

('131 patent, col. 9, ll. 43-56.) There is no express requirement in claim 6 that the second and third pixels be next to each other or next to the claimed first pixels.

In support of its construction, Plaintiff relies upon Figure 4 and the surrounding specification description:

> Reference is made to FIG. 4, illustrating the diagram of the morphological dilation processing in the preferred embodiment of the present invention. It is noted that the lacuna regions in FIG. 4 to FIG. 7 are denoted as 401 in FIG. 4 and the white parts in FIG. 5 to FIG. 7. In FIG. 4, after using the morphological dilation processing, the boundary 402 of the lacuna region 401 dilates to the boundary 404. That is, the lacuna region after dilation equals the original lacuna region 401 plus the increasing lacuna region. The lacuna region 401 is the area left after removing the unwanted object, and the boundary 402 (denoted as 0) is in the interior of the lacuna region 401. The pixels around the boundary 402 are the pixels 403 (denoted as 1) of the first round and the pixels 404 (denoted as 2) of the second round. The pixels 403 of the first round surround the boundary 402 and the pixels 404 of the second round surround the pixels 403 of the first round. The morphological dilation processing dilates the boundary of the lacuna region to reduce the artifact effect.

('131 patent at col. 7, ll. 4-21.) The cited passage describes Figure 4, which is a diagram illustrating a step called the "morphological dilation process." (*See id.*) The cited passage does not reference "second pixels" or "third pixels." Instead, it references a boundary 402 of the lacuna region 401 that dilutes to a boundary 404 after using "morphological dilation processing." (*Id.*) The Court agrees with the Defendants in that the cited passage is not in reference to claim 6 and is instead a reference to claim 11, which expressly claims the morphological dilation step. (*See, e.g.*, claim 11 ("The image-capturing method of claim 6 … using a morphological dilation processing to dilate the boundary of the lacuna region before the color distribution analysis step.").) Moreover, according to claim 11 and Figure 3, the morphological dilation process occurs before the weighted interpolation method and even before the color distribution analysis step expressly found in Claim 6. (*See, e.g.*, '131 patent, Figure 3; *see also* col. 5, ll. 52-57.) Further, the cited passage is actually in contradiction to the claim's reference to "second pixels." For example, claim 6 expressly requires the "second pixels" to be part of the lacuna region,

whereas the pixels described in reference to Figure 4 are located outside of the lacuna region. Thus, the Court agrees with Defendants that the part of the specification relied upon by Plaintiff is not relevant to the claimed second and third pixels in claim 6. Likewise, the Court rejects Plaintiff's argument that this specification citation reveals the intentions of the inventors to define second and third pixels as merely rounds of pixels that are adjacent to the first and second pixels, respectively. The Court disagrees that the simple recitation of the terms "second" and "third," by itself, requires that the pixels must necessarily be located next to each other.

The Court finds no support in the claims or specification for the Plaintiff's constructions, and they are rejected accordingly. On the other hand, the majority of Defendants' constructions appear to simply include other portions of the claim. While claim 6 requires weighting and computing the values of the third pixels and inserting the result into the second pixels according to the recited algorithm, the Court is not convinced that the inclusion of the phrase "weighted interpolation algorithm" is necessary or appropriate as argued by the Defendants. Similarly, Defendants' requirement that the second pixels be "filled in with values resulting from the [claimed] algorithm" and that the third pixels are "used in the [claimed] algorithm to obtain values to insert into the second pixels" includes surrounding limitations of the terms and how these terms are used based on the claim language and do not directly relate to the inherent meaning of these terms. The Court does not believe that Defendants' offered constructions are any more helpful than the simple language surrounding the terms. Likewise, while the third pixels may be a part of the first pixels, the Court is not convinced that limiting the third pixels to a subset of the first pixels is warranted or necessary. While the Court finds that the claims sufficiently describe the second and third pixels, on balance and to help resolve the dispute between the parties, a construction will be helpful to the finder of fact. The Court also notes that

during the claim construction hearing, the Plaintiff had no dispute with the proposed constructions by the Court as to these terms, and the Defendants had no dispute to the proposed construction for the term "second pixels."

The Court hereby construes **"second pixels"** to mean **"set of pixels located in the lacuna region."**

The Court hereby construes **"third pixels"** to mean **"set of pixels located in the background area."**

C. "previously stored in an image database"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning. In the alternative, "stored before in an image database"	"recorded in a storage device that preserves a collection of image data prior to the start of the image-capturing method"

The disputed term "previously stored in an image database" appears in asserted claim 9 of the '131 patent.

(1) The Parties' Positions

Plaintiff submits that the "previously stored in an image database" term does not require construction and should be afforded its plain and ordinary meaning. (*See, e.g.*, Dkt. No. 48 at 4, 13-15.) In particular, Plaintiff argues that the claims do not require storing image data before the start of the image capturing process as proposed by Defendants. (*Id.* at 18.) Instead, the previously stored image data need only be presented during the comparison of the target image and the first image, which occurs after the image-capturing method has begun. (*Id.*) Plaintiff argues that the Defendants' construction adds unnecessary limitations to the claim that are not supported in the claims or specification. (*Id.* at 18-19.)

Defendants respond that this term, standing alone, would be ambiguous to one of ordinary skill in the art and that their construction provides meaning to the term. (Dkt. No. 50 at 2.) Defendants argue that Plaintiff's construction does not resolve any ambiguities to this term. (*Id.* at 3.) In particular, Defendants argue that the term is vague because it does not indicate when the target image was stored, for how long it was stored, and how large the image database must be. (*Id.* at 25-26.) Defendants argue that because step 301 from Figure 3 is the first step of the image-capturing method, "previously stored" should be construed as being "prior to the start of the image-capturing method." (*Id.* at 27.) Defendants rely upon dictionary definitions and prior art contemporaneous with the '131 patent for their construction of the term "image database." (*Id.* at 27-28.) Defendants argue that their construction allows the comparison of the first image with the "previously stored" target image to take place after the image-capturing method has begun, but clarifies that the storing of the target image must be done before the image-capturing method has begun. (*Id.* at 29.) Defendants argue that Plaintiff's construction is just as vague as the disputed term. (*Id.* at 30.)

Plaintiff replies that the term is not ambiguous and should be afforded its plain meaning. (Dkt. No. 52 at 8.) Plaintiff argues that the claims do not require image data before the start of the image capturing process. (*Id.* at 9.) Rather, the previously stored image data need only be presented during the comparison of the target image and the first image, which occurs after the image-capturing method has begun. (*Id.*) Plaintiff argues that the Defendants are attempting to impermissibly import limitations from the specification, which are further inconsistent with the term's plain meaning. (*Id.*)

(2) Analysis

Dependent claim 9 provides the following limitation: "[t]he image-capturing method of claim 6, wherein the identifying step further comprises comparing the first image with the target-image **previously stored in an image database**." (emphasis added.) Claim 6 recites a first step of the image-capturing method comprising "inputting a first image" and a later "identifying step to identify at least a target-image…" The parties' primary dispute is whether the target images must have been stored previous to the start of the image-capturing method (as proposed by Defendants) or only prior to the start of the identifying step (as proposed by Plaintiff).

The claim language does not require the target images to have been stored prior to the start of the image-capturing method as opposed to merely before the identifying step, nor do the Defendants advance any legitimate argument that the claim warrants such a temporal limitation. Instead, the Defendants largely argue that the specification requires that the storage of the target image in the database takes place prior to the inputting an image step. (*See, e.g.*, '131 patent, col. 5, ll. 39-47.) Defendants also argue that "[t]here is no point in storing a wanted object after the image-capturing method has begun and then performing the comparison because there is not much time between those two steps." (Dkt. No. 50 at 30.)

The Court rejects Defendants' arguments. The Court finds that the examples in the specification are non-limiting embodiments that should not be imported into the claims. The Federal Circuit has consistently held that "particular embodiments appearing in the written description will not be used to limit claim language that has broader effect." *Innova/Pure Water*, 381 F.3d at 1117. Even where a patent describes only a single embodiment, absent a "clear intention to limit the claim scope," it is improper to limit the scope of otherwise broad claim language by resorting to a patent's specification. *Id*. The Court is not convinced that the broadly

used "previously stored" term should be limited to one of the disclosed embodiments, particularly when there is no indication of an intent by the patentee to do such. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (citing numerous cases rejecting the contention that the claims of the patent must be construed as being limited to the single embodiment disclosed and stating that claims are to be given their broadest meaning unless there is a clear disclaimer or disavowal); *see also Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1988) ("Although the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims."); *see also Phillips*, 415 F.3d at 1323. Further, generally terms are presumed to possess their ordinary meaning, although this can be overcome by statements of clear disclaimer. *See SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1343-44 (Fed. Cir. 2001). The Court finds no requirement in the claims, prosecution history, or specification that the target images must have been stored prior to the start of the image-capturing method as opposed to only prior to the start of the identifying step. The Court finds that rejecting the Defendants' argument resolves the parties' dispute as to this disputed portion of the term.

The parties also dispute whether the term "image database" should be construed. While the term "image database" is repeatedly used in the specification, the Defendants do not rely on the specification for its meaning, nor do they argue that there are any limiting statements in the intrinsic record for this term. Various dictionary definitions offer similar definitions for the terms "database" and "store," and other prior art references cited by the Defendants provide still other related definitions. (*See, e.g.*, Dkt. No. 50 at 27-28.) While various dictionary definitions (and other extrinsic evidence) provide slightly different meanings, the Court is not convinced

that simply substituting dictionary definitions for various parts of the disputed term is helpful to the jury or appropriate. Because construing the "image database" term will only tend to confuse rather than clarify, the term requires no further construction. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims.") (*citing U.S. Surgical*, 103 F.3d at 1568). Further, the Court finds that there is no genuine dispute as to the word "image database," and in any event, the term has no special meaning other than its plain meaning. The Court also notes that during the claim construction hearing, neither party offered any argument on this term based on the Court's proposed construction.

The Court hereby construes **"previously stored in an image database"** to have its plain meaning.

V. CONCLUSION

The Court adopts the above constructions set forth in this opinion for the disputed terms of the patent-in-suit. The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions

adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 25th day of June, 2014.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE